

APPLICATION FOR UNITED STATES LETTERS PATENT

by

**KELLY C. MORGAN
RONALD J. PERRELLA
KEVIN G. CARTWRIGHT
KARL B. CARTWRIGHT
AND
STEVEN N. TISCHER**

for a

**BUSINESS DESCRIPTION VOCABULARY
FOR
STANDARDIZED, EXTENSIBLE INTEROPERATION**

SHAW PITTMAN
1650 Tysons Boulevard
McLean, VA 22102-4859
(703) 770-7900
Attorney Docket No.: BS01-166

1163440

1006705 122704
T0222T 5029200T

**BUSINESS DESCRIPTION VOCABULARY
FOR
STANDARDIZED, EXTENSIBLE INTEROPERATION**

This application is a continuation of U.S. Serial No. _____, Attorney Docket No. BS01-165, entitled "System and Method for Creating Extensible Content," filed December 21, 2001.

A portion of the disclosure of this patent document contains material which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction of any one of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all copyright rights whatsoever.

BACKGROUND

Field of the Invention

[0001] The present invention is directed to data management. More particularly, the present invention is directed to systems and methods for gathering data and, using an arbitrary structure such as a document type definition (DTD), generating and emitting world wide web consortium (W3C) compliant extensible markup language (XML).

[0002] While the present invention is directed generally to generating or creating any content, the following patent description focuses on collecting data (content) for creating a graphics package in the form of a dining guide directory. However, those

skilled in the art will appreciate that this particular instance or use of the invention is to be considered non-exhaustive and exemplary in nature only.

Background of the Invention

[0003] The field of graphics has enjoyed substantial growth over the past few years. As high performance computers and printers have become more readily available and inexpensive, software application writers have developed several graphics applications that have significant capabilities. For example, PhotoShop and Illustrator both from Adobe (San Jose, CA) provide, respectively, advanced image editing capabilities and vector graphics software. These software packages allow graphics designers to complete a graphics design from beginning to end on a single personal computer and output, for example, a portable data format (PDF) file, which can be displayed on another personal computer or can be printed.

[0004] Typically, programs such as PhotoShop and Illustrator operate using proprietary file formats that may not lend themselves to being easily manipulated for other programs to use or for any other purpose that a user might desire. In the case of yet another Adobe software package, namely Acrobat, a file format known as XFDF is employed. While this file format is known to those skilled in the art and useful for the purpose for which it was designed, the format is not universally employable. That is, the format works well with software programs written by Adobe, but may not be convenient to be used for other business-specific purposes.

[0005] Another problem existing in prior art graphics systems is the lack of data validation, meaning, for example, that required content parts related to a pre-defined structure are present. While there are tools for data entry validation against

standardized structures (e.g., Documentum (Pleasanton, CA)), they are typically full-blown, large, stand-alone applications in their own right.

SUMMARY OF THE INVENTION

[0006] The present invention provides a ubiquitous, inexpensive way to utilize particular business structure files (e.g., document type definitions (DTDs), SML Schema, or other similar files) to allow data entry on multiple devices and platforms without rewriting the entry tool each time business content structures are changed. The present invention also provides control over the interface for data entry with a standardized construct.

[0007] More particularly, the present invention utilizes an existing, ubiquitous, portable application (e.g., Adobe Acrobat) as a lightweight (small software footprint) data form entry tool. Combined with business-content structure files (DTDs) and procedural code written to operate in conjunction with a standardized application (e.g., Adobe Acrobat) using standardized transformation extensible stylesheet language construct (XSL), the present invention provides a complete, ultra-lightweight, extensible/repurposable tool for validated content entry and creation of content in an extensible markup language (XML) format.

[0008] Although the present invention has wide ranging applicability, it may be, for example, implemented in the specific context of publishing dining guides that may be distributed along with or in telephone books (i.e., the Yellow pages) in a particular locality. In this example, advertisement salespeople sell advertisement space in the dining guide and enter basic information such as restaurant name, address, and advertisement type in a database. This information is then populated in a form that is

displayed to a graphics artist. The graphics artist modifies and/or adds to the form as necessary. Then, the graphics artist is given an opportunity to edit the advertisement itself, which includes at least some of the information that was displayed by the form.

[0009] The graphics artist may also edit photographs and logos that may be included as part of the advertisement. Ultimately, the graphics artist saves the advertisement. In accordance with the present invention, the advertisement is saved not only in the native format of the graphics application being used (e.g., Adobe Acrobat's XFDF format), but the native format is also preferably transformed into and saved as world wide web consortium (W3C) compliant and valid XML using XSLT (extensible stylesheet language). As a result, the data/information underlying the advertisement can be subsequently retrieved and/or repurposed.

[0010] It is therefore an object of the present invention to provide a system and method that is designed to generate content by employing a ubiquitous and lightweight software package as a data entry tool and saving resulting data files in an XML format.

[0011] It also an object of the present invention to provide a system and a method of employing XML to easily repurpose information that might originally be collected with a different purpose in mind.

[0012] It is also an object of the present invention to facilitate the overall generation of content directed to a graphics design, directory, etc. through the use of graphics generation software packages, databases and XML.

[0013] It is still another object of the present invention to provide an extensible stylesheet language construct to transform a native application file format into a business-specific XML format.

[0014] These and other objects of the present invention will become apparent upon a reading of the following detailed description of the invention in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Figure 1 shows a dining guide that is a compilation of advertisements generated and stored in accordance with the present invention.

[0016] Figure 2 is an exemplary page of a dining guide including different advertisement styles.

[0017] Figure 3 illustrates exemplary components for practicing the present invention.

[0018] Figures 4-10 illustrate exemplary data input and graphics screens in accordance with the present invention.

[0019] Figure 11 illustrates an exemplary series of steps for practicing the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0020] The purpose of the present invention is to facilitate, using standardized tools and systems, the generation of extensible content, one instance of which could be a multi-page book, insert, or other directory that comprises several types of entries. While much of the following describes an instance of a graphics product, those

skilled in the art will appreciate that the scope of the present invention is intended to cover, generally, any extensible content.

[0021] Figure 1 shows one such exemplary directory product, a dining guide, that might be distributed at the same time that a telephone book such as the Yellow Pages is distributed in a particular locality, or may be included in the Yellow Pages.

[0022] Figure 2 shows an exemplary page of the dining guide of Figure 1, including several advertisement styles. For example, advertisements 201a and 201b include a photo or logo and are larger than advertisements 203a, 203b and 203c, which do not have a photo or logo. In addition, the amount of text associated with different advertisements varies as does the actual size of the ad. Each of the advertisements shown on the exemplary page of Figure 2 is generated by the method and system of the present invention.

[0023] Figure 3 illustrates several exemplary components for implementing the present invention in the context of a dining guide. Account sales personnel sell advertising space to, in this case, restaurants located within a specific geographical region. The responsible account sales person (or another employee of the company) then enters basic data about the restaurant into publishing database 303 via workstation 301. Included with the entered data are preferably both an advertisement ID (Ad ID) and copy ID, explanations of which will be provided below. Then, periodically, the information stored in publishing database 303 is transferred to graphics database 305, which can be accessed by workstation 307, which is operated by a graphics artist. Ultimately, workstation 307 outputs an encapsulated PostScript (EPS) file which, for example, is forwarded to a printer 309 for printing and

10026705 "122701
distribution along with, for example, the Yellow pages. Separate databases 303 and 305 are preferably employed to keep the activities of salespeople and graphics artists logically separated. However, these two databases could also be combined into a single database if such an implementation were desired. In this implementation of the present invention, data in publishing database 303 flows through a daily batch process into graphics database 305. At the same time, a new PO (purchase order) corresponding to the newly-sold advertisement is passed to the graphics artist, which alerts the graphics artists that a new advertisement needs to be worked on.

[0024] Figures 4-10 illustrate exemplary data input and graphics screens in accordance with the present invention. Preferably, Adobe Acrobat (e.g., version 5.0), or a software application that has similar functionality, is used to create the forms and elements of the screens shown in Figures 4-10. Referring first to Figure 4, a graphics artist working at work station 307 would first be presented with a log-on screen via which he or she would enter a user ID and a copy ID. The copy ID identifies a particular advertisement to be worked on and corresponds to a copy ID entered by a salesperson (or other employee) into workstation 301 and stored in publishing database 303.

[0025] Assuming there is a match between a copy ID (and thus a corresponding file) in graphics database 305 and the copy ID entered in the log-on screen of Figure 4, then a screen such as, for example, the screen of Figure 5 is preferably displayed to the graphics artist. Using the data from the corresponding file, the form of Figure 5 is populated with the information collected and stored by the salesperson. The form of Figure 5 also displays an advertisement or Ad ID. While the copy ID is an identifier

of a particular advertisement that may be used in, for example, several different dining guides, the Ad ID identifies a particular advertisement for a particular dining guide. In other words, each Ad ID might be associated with several different copy IDs.

[0026] Referring still to Figure 5, information such as the restaurant name, its address and telephone number, as well as an e-mail address, website URL, the year the restaurant was established and a main selling point (e.g. “centrally located,” or “reasonable prices”) are displayed.

[0027] In the middle section of the screen of Figure 5 additional information about the particular ad is displayed including the directory in which the ad will be published, a customer ID and the salesperson responsible for selling the ad.

[0028] In addition, on the right hand side of the middle portion of the screen of Figure 5 the graphics artist is given the opportunity to choose, via a pull-down menu, a restaurant heading. An exemplary pull-down menu for restaurant headings is shown in Figure 6. Also, the graphics artist is requested to include information related to heading code (HC), which is a number associated with a specific Yellow page directory heading category. The graphics artist can also choose the type of cuisine through a pull-down menu such as that shown in Figure 7. Still further, the graphics artist can choose, via a pull-down menu like that shown in Figure 8, a universal directory advertising code (UDAC) which specifically identifies a particular advertisement style. The following table provides several examples of the types of advertisement styles that can be made available to the graphics artist via the system and method of the present invention.

UDAC	Description	Ad Dimen- sion	Specifications
DGCUP N	Coupon	288 x 153	Standard display ad content specifications
DGRL	Small Regular Listing Display Ad Text Only.	580 x 61	Up to 3 lines of text @ 100 Characters Per Line (CPL). Text Only. The main number is located on the left and additional telephone numbers can be included in text.
DGDL	Double Regular Listing Display Ad. Picture or Logo (Left) and Text (Right) 2 additional addresses may be substituted for picture/logo.	580 x 122 Picture Dimen- sions 126 x 80	Picture in designated area (left) and up to 7 lines of text @ 100 CPL. The main number is located on the left and additional telephone numbers can be included in text.
DGTL	Triple Regular Listing Display AD. Large Picture or Picture and Logo on left. Logo's and Text on right Or Text only on right	580 x 183 Picture Dimen- sions 126 x 136	Larger picture, Logo or Picture and Logo in designated area and up to 12 lines of text @ 100 CPL and or a combination of text and logo's in text area. Logos must be placed at the top. No more than 3 Logos permitted. Logos must have like treatment and may not be larger than 67 x 67 pts The Spec Book must be reviewed to ensure that all rules are adhered to when advertising more than one restaurant. The main number is located on the left and additional telephone numbers can be included in text.
DGQP	Quarter Page Display Ad	288 x 306	Standard ad content specs
DGHP	Half Page Display Ad	580 x 308	Standard ad content specs
DGFP	Full Page Display Ad	580 x 620	Standard ad content specs
DGANC	Anchor Listing for Display Ads	580 x 30	The Anchor is the free listing that will accompany every sold Display ad (DGQP and

			larger). This listing will read <i>"For more information please see our ad in this section"</i>
DGIBC	Full Page Inside Back Cover Ad	580 x 720	Sold as Full Page only. Standard ad content specs
DGIFC	Full Page Inside Front Cover Ad	580 x 720	Sold as Full Page only. Standard ad content specs
DGOBC	Full Page Outside Back Cover Ad	580 x 720	Sold as Full Page only. Standard ad content specs

[0029] Once the basic information related to a particular advertisement is populated in the upper and middle sections of the form as shown in the screen shot of Figure 5, the graphics artist then chooses, in the bottom portion of the form, one or more of several "amenities." Such amenities might include whether particular credit cards are accepted, whether smoking is permitted, or whether delivery is available. Other available options can be readily gleaned from the form of Figure 5. Figures 9a and 9b show, respectively, additional options that would be displayed to the graphics artist in the lower left hand portion of Figure 5 if the UDAC selected was a DGDG or DGTL, which are respectively a dining guide double listing and dining guide triple listing. In the case of the former, a logo or photo can be included with the advertisement. In the case of the latter, three logos or photos can be selected. As will be readily understood by those skilled in the art, the screens and options presented to the graphics artist will depend substantially on the UDAC that has been selected. In this way, the graphics artist will be prompted only for the information that is necessary to fill out and complete a particular advertisement style, thereby streamlining the overall task.

[0030] Referring again to Figure 5, the lower left-hand corner of the bottom portion of the form includes an area that, after being used for, e.g., the forms of Figures 9a or 9b (if necessary), preferably displays the advertisement in the format corresponding to the selected UDAC. In a preferred embodiment, the system of the present invention permits the graphics artist to click on the edit ad button located immediately below that area, thereby spawning a new graphics page within Adobe Acrobat (assuming that is the software application being used) that shows a more comprehensive view of the advertisement. Figure 10 shows an exemplary screen shot of the newly-spawned page. PhotoShop or Illustrator can be used to create or edit photos or logos that are to be included in the advertisement. Once the session with PhotoShop or Illustrator is complete and the specific graphic (photo or logo) is saved, the application controlling the process according to the present invention reverts the user back to the spawned page shown in Figure 10. The artist completes the ad by entering the body copy and returns to the form of Figure 5 and then saves the ad in accordance with the principles of the present invention, which will be described in detail below.

[0031] Figure 11 depicts an exemplary series of steps 1100 for practicing the present invention. In an exemplary scenario, an artist receives a printed PO or purchase order (step 1101) that has been generated by a salesperson who sells advertisement space and, in this particular case, advertisement space in a dining guide. As described earlier, at least some of the information on the PO is keyed into a computer system by the salesperson himself, or by another employee. Such information will typically include firm (restaurant) name, telephone number, and address, etc, making that

information automatically available later to the electronic form in accordance with the present invention. This allows the later automatic population of this information into the electronic form without re-keying.

[0032] Having received the PO, the artist launches a software program by opening a file such as "login.pdf" (step 1103), which is a PDF formatted file that causes Adobe Acrobat to be automatically launched. Login.pdf is a form that preferably includes fields for entering an artist's user ID and a copy ID (Figure 4), which presumably is available from the PO. The copy ID is a numeric number tagged to a particular file and is preferably linked to a particular customer. Preferably, each customer has its own unique number.

[0033] At step 1105, the process according to the present invention checks graphics database 305, for example, to match the entered copy ID with an existing file, and preferably an existing XML file, as will be explained in more detail below. If a match is found (step 1107), then at step 1111, a form like that shown in Figure 5 is launched and populated with data for the ad corresponding to the copy ID. If no match is found, then an error message is preferably generated and displayed at step 1109 and the process ends.

[0034] Assuming the form of Figure 5 is an Adobe Acrobat form, the data would be formatted according to Adobe's native XFDF file format, which is employed by Acrobat and is used to reload information back into a previously-created PDF form. In accordance with the present invention, the information that is reloaded, namely, the information entered by a salesperson (or employee) or the graphics artist himself, is stored not only in an XFDF format, but also preferably in an XML format, thereby

exploiting the advantages of world wide web consortium (W3C) compliant and valid XML.

[0035] More specifically, data for each advertisement is saved not only in an XFDF format, but also as XML, in accordance with, for example, a document type definition (DTD) such as the DTD set forth in Appendix A, which is designed, in this case, with a particular dining guide structure in mind. As a result, it is significantly easier, for example, to modify and/or repurpose the information after it has been stored. In the case where existing content that has been previously created in accordance with the process of the present invention needs to be edited, the XFDF format file is opened by the Acrobat application and directly populates the form. After corrections are made the process of saving XML is repeated whereby the originally-saved XML file is replaced with another one of the same name, which includes the revisions. Also, another revised XFDF file is created to replace the previous version. An exemplary XSLT file is appended hereto as Appendix B, and those skilled in the art will readily appreciate how to apply such an XSLT file to data stored in an XFDF format, for example.

[0036] At step 1113, the artist fills out or edits any fields in the form of Figure 5 that are missing or need correcting. The artist also chooses ad size, amenity icon locations and, depending on the ad size and available options, chooses the numbers of logos and/or photos, and then clicks the edit button. In other words, the graphics artist clicks on all the desired boxes in the lower third of Figure 5 and chooses from the several available options depending on the particular UDAC (advertisement style). Each of the icons is preferably preset as part of an overall data structure that defines

the overall dining guide, namely the DTD, or document type definition. In the case of a basic advertisement, for example, the XML file comprises elements such as “payment options,” wherein a subset of payment options might include the possibility “accept credit cards,” and wherein a subset of “accept credit cards” might include “American Express,” “Diner’s Club” or “no credit cards accepted.” These elements are easily recognizable in the DTD of Appendix A.

[0037] The XML representation and storage of the data upon which a particular advertisement is based is a significant aspect of the invention. The resulting XML file, which includes separate structured elements, is not directly related to printing or any other predetermined use. Accordingly, the XML file can be easily repurposed, as desired. One example of repurposing might include using a portion of the text of an advertisement (e.g., a slogan or main selling point) as the content for a voice portal, whereby when a person dials into the voice portal to find or learn about a restaurant, the person would hear the selected text synthesized and spoken to them, via a text-to-voice system. Another repurposing example is to use the selected text as part of a text message advertisement that is sent, on demand, to a wireless pocket pager.

[0038] Referring again to Figure 11, at step 1115, upon clicking the edit button in Figure 5, a new page is spawned on workstation 307 showing the actual advertisement layout with the correct advertisement size along with populated data, correctly colored, etc. This spawned page preferably uses Adobe Acrobat (or a similar graphics program) and the graphics artist then proceeds to complete the ad (step 1117) by making any necessary color changes or modifications to logos or photos, for example.

[0039] The new page that is spawned is based on the selected template or UDAC. If a logo or photo is called for in the layout, then a graphics box is preferably allocated at a predetermined location. The artist clicks on this location to launch, for example, Adobe Illustrator or PhotoShop for editing that graphics box. In the XML that is ultimately saved, the logo or photo is saved as a file name or link to a file.

[0040] There are significant advantages to relying on XML instead of a native format of a particular software application, such as Adobe's XFDF format. For example, a standard option of XML is validation. Valid XML means that the XML file must be consistent with the structure of the corresponding DTD. Thus, if a firm (a restaurant in the example described above) name is required in the corresponding DTD, the corresponding XML file will not be valid unless a firm name has been entered. In addition, with XML it is possible, for example, to delineate how many characters are permitted within a selected section of an advertisement, e.g. 100 characters, 500 characters, etc. Accordingly, the structural capabilities of XML are greater than the typical formats of native graphics applications, including Adobe Acrobat.

[0041] To exploit the advantages of XML, the present invention uses a structure having several hierarchical nested structures that describe the various combinations available, including each UDAC, sub-UDACs and combinations of UDACs. As can be readily appreciated, using Adobe Acrobat as a data entry tool enables the use of a business specific structure without having to require a user to have a business specific application.

[0042] When the artist has finished with Illustrator or PhotoShop, the screen displayed to the artist will revert back to that shown in Figure 5. The artist will then

have the opportunity to save the advertisement by clicking the save button, step 1119. Then, at step 1121 the information related to the entire advertisement that is being saved is saved in the native application format (Adobe XFDF in this case), XML for later retrieval by employing transformation using a pre-designated XSLT file, and preferably also encapsulated PostScript (EPS) (step 1123), which is preferably used by printing devices.

[0043] While the directory generating implementation of the present invention has been described in the context of workstation 307 being connected to a database, workstation 307 could be operated independently, that is, not connected to a network. In such a case, an entire ad could be generated without ever accessing an external database.

[0044] Again, to generate the XML file, an XSLT file is used to translate or transform the XFDF native format. A Javascript “plug-in” can be used to interact with the Adobe Acrobat, for example, via Acrobat’s available application program interface (API) to access the native XFDF. The XSLT ensures that the XML that is formed is compliant to the pre-specified DTD, whereby the XML will be valid and well-formed, meaning that, for example, beginning and ending tags are accurately provided.

[0045] Thus, as can be readily appreciated by those skilled in the art, the present invention provides advantageous systems and methods that help to facilitate the generation of extensible content generally, and in at least one specific example, the publication of directories, such as dining guides.

[0046] As can also be readily appreciated in view of the foregoing, the present invention provides the ability to use any arbitrary structure (e.g., a DTD, etc.) to plug directly into the form data entry application of the present invention to obtain validated data entry. One exemplary use of an arbitrary structure might be to employ a predefined DTD for ordering lunch. The "ordering lunch DTD" could be plugged into a ubiquitous or otherwise readily available software package such as Adobe Acrobat, whereby a user could easily generate W3C compliant XML based on the specified DTD. Of course, some program code would be needed to create the form fields consistent with the structure in the arbitrary DTD.

[0047] There is also great potential to use various software clients on different devices to allow the use of XSL files to automatically create input screens on the devices. This would mean both a structure file (e.g. DTD, XML schema, etc.) and a screen controlling XSL file could be plugged into the client application to automatically control the look and feel of the user interface for that device. For example, employing the same lunch ordering scenario, one could extend the ordering functionality to a wireless device by sending an XSL file corresponding to the handheld device's characteristics, along with a DTD file to a person wishing to create content on that device. Accordingly, the steps required to create a data entry screen would be unnecessary, because the XSL file for that device would automatically create the data entry screen based on the XML structure in the DTD.

[0048] The foregoing disclosure of the preferred embodiments of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed.

Many variations and modifications of the embodiments described herein will be obvious to one of ordinary skill in the art in light of the above disclosure. The scope of the invention is to be defined only by the claims appended hereto, and by their equivalents.

[0049] Further, in describing representative embodiments of the present invention, the specification may have presented the method and/or process of the present invention as a particular sequence of steps. However, to the extent that the method or process does not rely on the particular order of steps set forth herein, the method or process should not be limited to the particular sequence of steps described. As one of ordinary skill in the art would appreciate, other sequences of steps may be possible. Therefore, the particular order of the steps set forth in the specification should not be construed as limitations on the claims. In addition, the claims directed to the method and/or process of the present invention should not be limited to the performance of their steps in the order written, and one skilled in the art can readily appreciate that the sequences may be varied and still remain within the spirit and scope of the present invention.